Amendments to the Claims

This listing of claims will replace all prior versions and listing of claims in the application.

Listing of Claims

1. (Currently Amended) A method for the manufacture of crank cases and cylinder heads from grey cast iron comprising ~~consisting of~~ the steps of:

providing a molten controlled-content grey iron metal having a carbon equivalent of about 4.05%, comprised of about 3.40% to about 3.45% carbon, about 1.80% to about 1.90% silicon with less than about 0.03% phosphorus, while maintaining base iron sulfur at about 0.05% to about 0.07%, manganese at about 1.7 times the percentage of sulfur plus about 0.30% to about 0.40%, and base iron chromium less than about 0.10%;

transferring said molten controlled-content grey iron metal to a pouring ladle;

alloying said molten controlled-content grey iron metal with tin in said pouring ladle to a total tin content of about 0.05% to about 0.10% to provide a molten tin-alloyed, controlled-content grey iron metal;

inoculating said molten tin-alloyed, controlled-content grey iron metal with a grey iron inoculant to a further silicon addition of from about 0.10% to about 0.12%;

pouring said molten, tin-alloyed, inoculated controlled-content grey iron metal as soon as possible after said inoculation into a casting mold; and

shaking out the resulting casting out of the casting mold while at a temperature over 1400°F.

2. (Previously Presented) The method of claim 1 wherein the step of providing the molten controlled content grey iron metal comprises determining the carbon, silicon, phosphorus, sulfur, manganese and chromium contents of scrap steel, grey iron ingots, and recovered grey iron scrap material;

melting the scrap steel, grey iron ingots, and recovered grey iron scrap material in relative proportions to approximate the molten controlled content grey iron metal; and

adjusting the carbon, silicon, phosphorus, sulfur, manganese and chromium contents of the approximated molten controlled content grey iron metal to the extent necessary to provide the molten controlled content grey iron metal.

3. (Previously Presented) The method of claim 1 wherein the molten controlled-content grey iron metal is alloyed with tin in a percentage dependent on an important section of the part being cast that is required to have greatest strength and/or machinability.

4. (Original) The method of claim 3 wherein the molten controlled-content grey iron metal is alloyed with tin at the high end of the percentage range for parts with an important section that cools slowly.

5. (Original) The method of claim 3 wherein the molten controlled-content grey iron metal is alloyed with tin at the low end of the percentage range for parts with an important section that cools quickly.

6. (Cancelled)

7. (Cancelled)

8. (Cancelled)

9. (Original) A method for casting internal combustion engine parts with grey cast iron, comprising the steps of:

providing a molten grey iron metal having a carbon equivalent of about 4.05%, comprised of about 3.40% to about 3.45% carbon, about 1.80% to about 1.90% silicon with less than about 0.03% phosphorus, base iron sulfur of about 0.05% to about 0.07%, manganese of about 1.7 times the percentage of sulfur plus about 0.30% to about 0.40%, and base iron chromium less than about 0.10%;

alloying said molten grey iron metal prior to pouring with tin to a total tin content of about 0.05% to about 0.10% to provide a molten tin-alloyed grey iron metal;

inoculating said molten tin-alloyed grey iron metal prior to pouring with a grey iron inoculant to a further silicon addition of from about 0.10% to about 0.12%; and

casting an internal combustion engine part as soon as possible after said inoculation.

10. (Previously Presented) The method of claim 9 wherein the step of providing the molten grey iron metal comprises determining the carbon, silicon, phosphorus, sulfur, manganese and chromium contents of scrap steel, grey iron ingots, and recovered grey iron scrap material, melting the scrap steel, grey iron ingots and recovered grey iron scrap in relative proportions to approximate the molten controlled content grey iron metal; and

adjusting the carbon, silicon, phosphorus, sulfur, manganese and chromium contents of the approximated molten controlled content grey iron metal to the extent necessary to provide the molten controlled content grey iron metal.

11. (Previously Presented) The method of claim 9 wherein the molten grey iron metal is alloyed with tin in a percentage dependent on an important section of the internal combustion engine part being cast that is required to have greatest strength and/or machinability.

12. (Original) The method of claim 11, wherein the molten grey iron metal is alloyed with tin at the high end of the percentage range for internal combustion engine parts with an important section that cools slowly.

13. (Original) The method of claim 11 wherein the molten grey iron metal is alloyed with tin at the low end of the percentage range for internal combustion engine parts with an important section that cools quickly.

14. (Previously Presented) The method of claim 9 further comprising removing the cast part from its mold while it is in excess of 1400°F.

15. (Currently Amended) A method for casting internal combustion engine parts, comprising,

preparing a molten grey iron metal for pouring that ~~consists essentially of~~ comprises a carbon equivalent of about 4.05% with about 3.40% to about 3.45% carbon and about 1.80% to about 1.90% silicon with less than about 0.03% phosphorus, base iron sulfur of about 0.05% to about 0.07%, manganese of about 1.7 times the percentage of sulfur plus about 0.30% to about 0.40%, base iron chromium less than about 0.10%, and tin of about 0.05% to about 0.10%, by the steps of transferring the molten grey iron metal, absent the tin, to a pouring ladle, adding tin to the molten grey iron metal in said pouring ladle to said content of about 0.05% to about 0.10%, and thereafter inoculating the molten grey iron metal with an inoculant to a further silicon addition of from about 0.10% to about 0.12%;

pouring the molten grey iron metal as soon as possible after said inoculation into a casting mold; and

shaking the resulting casting out of the casting mold while at a temperature over 1400° F.

16. (Currently Amended) The method of claim 15 wherein the resulting casting includes an important section that cools slowly and the molten grey iron metal, when poured, has a total tin content of about 0.10%.

17. (Previously Presented) The method of claim 15 wherein the resulting casting includes an important section that cools quickly and the molten grey iron metal, when poured, has a total tin content of about 0.05%.